#### Step 1. Determine the diagnosis.

Using the history, physical examination and supporting studies, a medical diagnosis must be established. Refer to Section F (Specific Musculoskeletal Disorders and G (Specific Peripheral Nerve Disorders).

#### Step 2. Clearly define the job duties of the worker.

Do not rely solely on the employer's description of job duties. The worker's description of how they actually perform the duties is extremely important. Jobsite evaluations are always appropriate, but are sometimes unnecessary when the physician can identify the job duty which appears to be causing the symptoms and provide a method for ergonomically correcting the activity.

### Step 3. Compare the worker's duties with the Primary Risk Factor Definition Table.

Hours are calculated by adding the total number of hours per day during which the worker is exposed to the defined risk. Breaks, time performing other activities and inactive time are not included in the total time. When the employee meets the definition for a sole Primary Risk Factor and the risk factor is physiologically related to the diagnosis, it is likely that the worker will meet causation for the cumulative trauma condition. When the Primary Risk Factor identified is not physiologically related to the diagnosis, causation will not be established at this point and Step 4 needs to be considered.

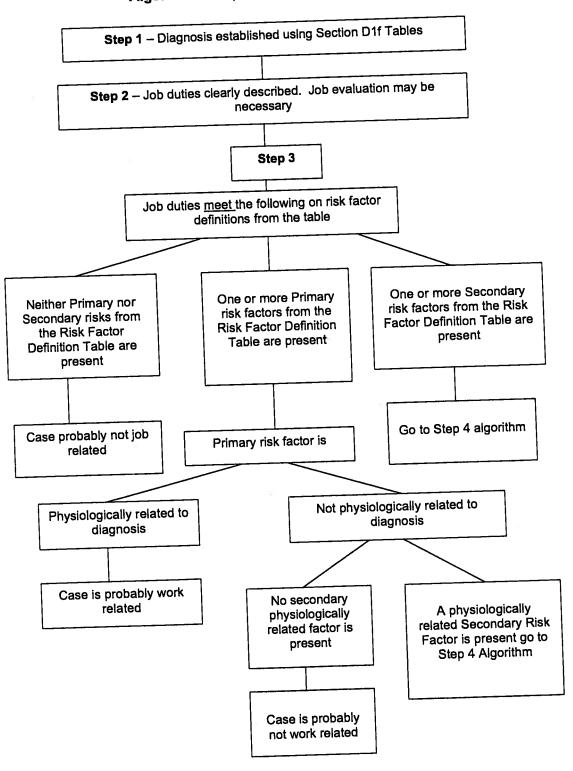
### Step 4. Compare the worker's risk factors identified in Step 2 with the Secondary Risk Factor definitions on the Risk Factor Definition Table. If secondary risk factors are identified proceed to the Diagnosis Based Risk Factor Table.

When no Primary Risk Factors are present but one or more Secondary Risk Factors are found on the Risk Factor Definitions Table proceed to the Diagnosis Based Risk Factor Table. Elements in this table are listed under the strength of evidence headings. This includes a category for strength of evidence for risks that have been demonstrated not to be related to the diagnosis. Consult the diagnostic category pertaining to the worker. For a number of less common diagnoses, little direct research has been done that meets our quality standards. Therefore, the risk factors for these diagnoses use the risk factors from physiologically related, better researched diagnostic titles. Initially, check the evidence statements for or against causation based on the secondary risks identified previously. If the Diagnosis Based Risk Factor table establishes a match between the Secondary Risk Factor(s) and other job duties, using the evidence based columns for the established diagnosis, the case is likely work-related based on evidence. If none of the evidence categories matches the worker, causation based solely on evidence from research has not been established.

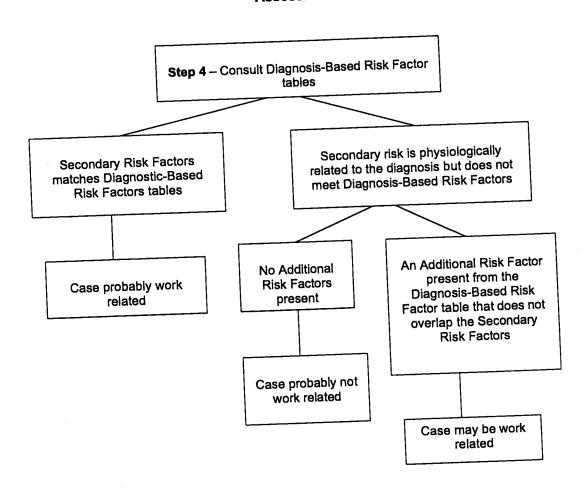
Step 5.

If an evidence based causation relationship, based on Steps 1-4, has not been established and the worker has one Secondary Risk Factor from the Risk Definition table, the physician may consult the last column of the Diagnosis Based Risk Factor table entitled "Additional Risk Factors." This category describes medically accepted physiologic risk factors for the diagnosis and risk factors which demonstrated an association with the diagnosis in lower quality studies that did not meet our standards of evidence. Some of the additional risk factors have less clear definitions due to lack of definition in the lower quality studies. These risk factors were added only when the medical consensus of the multi-disciplinary group agreed they were physiologically plausible. When a Secondary Risk Factor has been identified that does not meet the evidence based definitions in the Diagnosis Based Risk Factor Tables, physicians may use the other "Additional Risk Factors", as appropriate, to establish the presence of combined risk factors and establish causation. The worker must have met at least one of the Secondary Risk Factor definitions from the Risk Factor Definition table and that risk factor must be physiologically related to the diagnosis, in order to use the "Additional Risk Factors" in the Diagnosis Based Risk Factor table. Additional Risk factors that duplicate the conditions in the Secondary Risk Factor identified for the case may not be used. Any conclusions using this methodology are not strictly evidence-based and therefore the physician should include a discussion of why the Additional Risk Factors are pertinent in the particular case.

### **Algorithmic Steps for Causation Assessment**



### Algorithmic Steps for Causation Assessment



## **Cumulative Trauma Conditions**

# DIAGNOSIS - BASED RISK FACTORS

Hours are calculated by totaling the cumulative exposure time to the risk over an 8 hour day. Breaks or periods of inactivity or performing other types of work tasks are not included. Unless the hours are specifically stated below, "combination" of factors described below uses the Secondary Risk Factor Definitions from the Risk Factor Definition Table

		Carpal Tunnel Syndrome		Osteoarthritis of the Wrist	Accravated		Diagnosis
						Strong Multiple high quality studies	Evidence
Combination repetition and forceful tool use with	Combination of repetition and force for 6 hours.	Combination of force, repetition, and vibration.			No Quality Evidence Available	Good One high quality study or multiple adequate studies	FOR Sp
Mouse use more than 4 hours.		Wrist bending or awkward posture for 4 hrs.			Available	One adequate study	
Good evidence- Repetition alone less than or		Good evidence - Keyboarding less than or equal to 7 hrs. in good ergonomic position is NOT RELATED.				Specific Risk Factors	Evidence AGAINST
Tasks using a nand grip.		High repetition defined as task cycle times of less than 30 seconds or performing the same task for more than 50% of the total cycle time.	Prior Injury.	Repetition of activities affecting the joint involved for 4 hrs.	Awkward Posture (depending on the joint involved)	be present for at least 4 hours of the work day, and may not overlap evidence risk factors.	Non-Evidence-Based Additional Risk Factors to Consider. These factors must

## **Cumulative Trauma Conditions**

# DIAGNOSIS - BASED RISK FACTORS

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Risk Factor Defini	Risk Factor Definitions from the Risk Factor Definition Table  Evidence FOR Specific	sk Factor Definition Table  Evidence FOR Specific Risk Factors	tors	Evidence	Non-Evidence-Based Additional Risk Factors to
Diagnosis			Some	AGAINST	Consider. These factors must
	Strong Multiple high quality studies	Good One high quality study or multiple adequate studies	One adequate study	Specific KISK Factors	be present for at least 4 nours of the work day, and may not overlap evidence risk factors.
Carpal		awkward posture for 6 hours - Deboning		NOT RELATED.	
Tunnel Syndrome		Combination force, repetition, and	Combination cold and forceful		Extreme wrist radial/ulnar positions or elbows in awkward
(continued)		awkward posture.	repetition for 6 hours - Frozen food handling.		postures.
Cubital			Combination forceful tool use, repetition		Wrist bending and/or full elbow flexion/extension, repetition for 4 hours, vibration.
<u>Syndrome</u>			and probably posture for 6 hours - Holding		Repetitive pronation of forearm.
			repetition.		Sustained pressure at the cubital tunnel.
		Combination force.			Wrist in ulnar deviation. <sup>3</sup>
DeQuervain's Disease		repetition, & posture.			Repetitive thumb abduction and extension.
					Wrist bending in extreme postures.
		_			

## RISK FACTOR DEFINITIONS

CAUSATION MAY BE ESTABLISHED BY THE PRESENCE OF 1) A DIAGNOSIS-RELATED SOLE PRIMARY RISK FACTOR WHICH IS PHYSIOLOGICALLY RELATED TO THE DIAGNOSIS OR; 2) AT LEAST ONE SECONDARY RISK FACTOR THAT MEETS THE REQUIREMENTS FROM THE DIAGNOSIS-BASED RISK FACTOR TABLE

NOTE: Hours are calculated by totaling the cumulative exposure time to the risk over an 8 hour day. Breaks or periods of inactivity or performing

other types of work tasks are not included.

Culci Spec of		
Category	As a Primary Risk Factor	Secondary Risk Factor
Force and Repetition/Duration	6 hrs. of: > 50% of individual maximum force with task cycles 30 seconds or less or force is used for at least 50% of a task cycle-maximum force for most individuals is 3-5 kg of force.	4 hrs. of: > 50% of individual maximum force with task cycles 30 seconds or less or force is used for at least 50% of a task cycle-maximum force for most individuals is 3-5 kg of force.
	6 hrs. of: lifting 10 lbs > 60x per hour.	4 hrs. of: lifting 10 lbs > 60x per hour. *
	6 hrs. of: use of hand held tools weighing 2 lbs or	4 hrs. of: use of hand held tools weighing 2 lbs or greater.
Awkward Posture and Repetition/Duration	4 hrs. of: Wrist flexion > 45 degrees, extension > 30 degrees, or ulnar deviation > 20 degrees.	
	6 hrs. of: Elbow - flexion > 90 degrees.	4 hrs. of: Elbow - flexion > 90 degrees.
	6 hrs. of: Supination/pronation with task cycles 30 seconds or less or posture is used for at least 50% of a task cycle.	4 hrs. of: Supination/pronation with task cycles 30 seconds or less or posture is used for at least 50% of a task cycle.*
	50% of a task cycle.	

## RISK FACTOR DEFINITIONS

NOTE: Hours are calculated by totaling the cumulative exposure time to the risk over an 8 hour day. Breaks or periods of inactivity or performing MEETS THE REQUIREMENTS FROM THE DIAGNOSIS-BASED RISK FACTOR TABLE CAUSATION MAY BE ESTABLISHED BY THE PRESENCE OF 1) A DIAGNOSIS-RELATED SOLE PRIMARY RISK FACTOR WHICH IS PHYSIOLOGICALLY RELATED TO THE DIAGNOSIS OR; 2) AT LEAST ONE SECONDARY RISK FACTOR THAT

other types of work tasks are not included.	ks are not included.	
Category	( Factor	Secondary Risk Factor
Computer Work	Note: Up to 7 hours per day at an ergonomically correct workstation is not a risk factor.	
	> 4 hrs. of: Mouse use.	
Use of handheld vibratory power tools and Duration	6 hrs. for more common types of vibration exposure.	2 hrs. When accompanied by other risks.
Cold Working Environment		Ambient temperature of 45F or less for 4 Hrs. or more, such as handling frozen foods that are 10 degrees.

<sup>\*</sup> Referencing related studies, which established 4 hours as a cut off for symptoms of cumulative trauma conditions and which found 4 hours of exposure to be related to functional problems of the upper extremity, as well as reasonable inferences from physiological knowledge, 4 hours is considered the most reasonable cut off.